

**Cougar Looper Sorts  
FY 2017  
TIMBER CRUISE REPORT – Area 2**

1. **Sale Area Location:** Area 2 is located in portions of Sections 14, and 23 T4N, R8W, W.M., Clatsop County, Oregon.
2. **Fund Distribution: Fund:** BOF 100% CSL 0%  
**Tax Code:** 8-01 100%
3. **Sale Acreage by Area:**

Area	Harvest Type	Gross Acres	Stream Buffer Acres	New R/W Acres	Existing R/W Acres	Net Acreage
2	MC	48	1	1	0	46
<b>TOTALS</b>		<b>48</b>	<b>1</b>	<b>1</b>	<b>0</b>	<b>46</b>

4. **Cruisers and Cruise Dates:** Area 2 (2A – 2B) was cruised by Andrew Arvin, Jake John Choate, Bryce Rodgers, and Ed Holloran. The cruise was performed in late September and October, 2016.
5. **Cruise Method and Computation:** Area 2 is a modified clear cut unit. A variable plot cruise with a 40 BAF for conifer and a 33.61 BAF was used for hardwoods in all of these Areas.

Area 2A is a modified clearcut unit. 18 grade plots were sampled on a grid of 3 chains by 2.5 chains. All plots were measured.

Area 2B is a modified clearcut unit. 26 grade plots were sampled on a grid of 3 chains by 5 chains. All plots were measured.

Cruisers used Allegro data collectors, and were downloaded to the Atterbury Super A.C.E. program at the Astoria District for computing. See the attached Cruise Design for more details on the cruise method. The cruise calculations were processed in the Astoria District office.

<u>AREAS</u>	<u>PROJECT</u>	<u>TRACT</u>	<u>CRUISE TYPE</u>
2A	COUGARLOOP	A2A	CC2
2A	COUGARLOOP	A2A	TAKE
2B	COUGARLOOP	A2B	CC2
2B	COUGARLOOP	A2B	TAKE

6. **Area 2A** is approximately 70 year-old timber stand of Douglas-fir, with Western hemlock, Red alder, and some Sika spruce. The average take Douglas-fir tree size for harvest is approximately 24 inches DBH, with an average merchantable tree height of 96 feet. The average take hemlock tree size is approximately 20 inches DBH, with an average merchantable tree height of 64 feet. The average take alder tree size is approximately 18 inches DBH with an average merchantable tree height of 48 feet. The average volume per acre to be harvested (net) is approximately 21 MBF. All trees were cruised to a merchantable top of 6 inch DIB or 40% fp.

**Area 2B** is approximately 70 year-old timber stand of Douglas-fir, with hemlock, alder, and some spruce. The average take Douglas-fir tree size for harvest is approximately 26 inches DBH, with an average merchantable tree height of 94 feet. The average take hemlock tree size is approximately 17 inches DBH, with an average merchantable tree height of 54 feet. The average take alder tree size is approximately 15 inches DBH with an average merchantable tree height of 44 feet. The average volume per acre to be harvested (net) is approximately 44 MBF. All trees were cruised to a merchantable top of 6 inch DIB or 40% fp.

Cedar was a reserved species in Area 2.

7. **Statistical Analysis: (See also "Statistics Reports," attached.)**

Area	Target CV	Target SE%	Actual CV	Actual SE%
2*	80*	9*	91.9*	13.8*

The statistics are for all areas and Take and Leave trees combined based on Net BF/Acre.

\*Area 2 was stratified into two areas 2A and 2B. Statistics are 2A CV = 71.6 and a SE = 17.4, while Area 2B had a CV = 65.6 and a SE = 13.1.

8. **Take Volumes by Species and Log Grades for All Sale Areas by MBF:** (See "Species, Sort Grade-Board Feet Volumes (Project)", "Statistics (Project)", and the "Stand Table Summary" attached). Volumes do not include "in-growth." The majority of defect and breakage was taken out during the cruise.

Species	DBH	Net Vol.	Special Mill	2 Saw	3Saw	4 Saw	% D & B	% Sale
Douglas-fir	26	1,167	9	1,013	128	17		67
W. Hemlock & True Fir	18	373		246	95	22	1	21
Sitka Spruce	28	3		3			-	<1
<b>Net Conifer Volume</b>		1,543						88

Species	DBH	Net Vol.	12" +	10" - 11"	8" - 9"	6" - 7"	% D & B	% Sale
Alder & Other hardwoods	16	206	80	56	12	58	4	12

**TOTAL NET VOLUME = 1,749 MBF**

**Sort Breakdown:**

Sort #	Species	Sort Specifications	Estimated Net MBF	Sale %
1	WH/fir	6" to 11" Sawlogs	145	8
2	WH/fir	12" to 20" Sawlogs	180	10
3	WH//fir	21" + Sawlogs	37	2
4	WH/fir	High Quality (12" +) Sawlogs	12	1
5	DF	6" to 11" Sawlogs	145	8
6	DF	12" to 20" Sawlogs	455	26
7	DF	21" + Sawlogs	485	28
8	DF	High Quality (12" +) Sawlogs	82	5
9	SS	16" + Sawlogs	3	<1
10	RA	6" to 9" Camprun Sawlogs	69	4
11	RA	10" + Camprun Sawlogs	136	8
12	Pulp	2" Pulp		

High Quality Volume was estimated at 8% of volume over 12 inches for Douglas-fir and 5% for Western Hemlock.

9. **Prepared by:** Edward M. Holloran

**Date:** \_\_\_\_\_

10. Approved by: John Talli

Date: 12/20/16

11. Attachments:
- Cruise Plans & Maps – (5 pages)
  - Species, Sort, Grade Reports – Take (3 pages)
  - Statistics Reports – (4 pages)
  - Stand Table Report – (2 pages)
  - Log Stock Table Report – Take (3 pages)

**CRUISE DESIGN  
ASTORIA DISTRICT**

**Sale Name:** Cougar Looper **Area(s)** 2A

**Harvest Type:** Modified Clear Cut

**Approx. Cruise Acres:** 47 **Estimated CV%** 80 **Net BF** **SE% Objective** 9 **Net BF**

**Planned (Unit) Sale Volume:** 1,457 MBF **Estimated Sale Area Value/Acre:** \$12,400

**A. Cruise Goals:** (a) Grade minimum 50 conifer and 10 hardwood trees:  
(b) Sample 17 cruise plots; (c) Other goals ( Determine "automark" thinning standards;  Determine log grades for sale value;  Determine snag and leave tree species and sizes;  Determine LWD (down wood) cubic feet and decay classes;  Determine "diameter limit" harvest parameters;

**B. Cruise Design:**

**1. Plot Cruises:** BAF 40 for Conifer and 33.61 for Hardwoods Full point  
Fixed Plot Size \_\_\_\_\_ Plot Radius \_\_\_\_\_ feet  
Cruise Line Direction(s) 90°/270°  
Cruise Line Spacing 2.5 chains  
Cruise Plot Spacing 3 chains  
Grade/Count Ratio 1 : 0 (All grade)

If plot falls clearly inside a buffer or No Harvest Area drop the plot. Take plots as marked on map. All Cedar is reserved Timber.

**C. Tree Measurements:**

- 1. Diameter:** Minimum DBH to cruise is 8" for conifers and 8" for hardwoods. Record DBH to nearest ½" for trees < 16", to nearest 1" for trees 16-24", and to nearest 2" for trees > 24". If tree diameters are estimated (only estimate on variable plot cruises), then record to closest estimate.
- 2. Bole Length:** Record bole length to nearest foot at TCD. For trees greater than 100 feet in merchantable height, estimating to the nearest 5 feet is acceptable.
- 3. Top Cruise Diameter (TCD):** Minimum top outside bark is 7" or 40% of DOB at 16' form point. Generally, use 7" outside bark for trees < 18" DBH and 40% of DOB @ FP for trees > 18" DBH.
- 4. Form Factors:** (1) Measure or estimate a 16' form factor for every conifer tree measured/graded; OR (2) Measure a minimum of 20 form factors for each major conifer species on the cruise area, and use these to calculate average FF for the species on the cruise. Hardwood form factors are a Standard 87.
- 5. Tree Segments:** Record log segments in "standard" log lengths in general use, such as 16', 32' and 40' lengths, whenever possible. Do not record odd segments just to maximize grade. Cull segments can be any length. For conifers, minimum

merchantable segment length is 12'; for hardwoods, it's 8'. Maximum segment length is 40'. One foot of trim is assumed for each merch. segment. Do not use "double dash" (--) feature on the data recorder except for the top segment of the tree.

**6. Species, Sort, and Grade Codes:**

- A. Species: Record as D (Douglas-fir); H (Western hemlock); S (Sitka Spruce); C (Western red cedar); NF (Noble fir); SF (Silver fir); A (Red alder); M (Bigleaf maple).  
For "leave trees" in partial cuts, or for marked "wildlife trees," add an "L" to the species code (such as DL, HL, CL, etc.)
- B. Sort: Use code "1" (Domestic).
- C. Grade: A = 1 Peeler; B = 2 Peeler; C = 3 Peeler; D = Special Mill; 2 = 2 Sawmill; 3 = 3 Sawmill; 4 = 4 Sawmill; R = Camp Run; 0 = Cull
- D. Alder Grades: 12" + = 1 Sawmill; 10"-12" = 2 Sawmill; 10"-8" = 3 Sawmill; and 8"-6" 4 Sawmill, or R = Camp Run; 0 = Cull.

**7. Deductions:** Estimate visible defect or damage as a "length deduction" (most often), or as a "diameter deduction," as applicable. Estimate hidden defect and breakage (usually some breakage is encountered in trees > 100 feet in height) on a "per tree" basis. Steep and broken topography generally results in higher breakage percentages than gentler topography, and hemlock generally breaks more than D-fir and spruce.

**8. Standard Field Procedures: Plot Type Cruises:** Mark cruise line beginning and end points with blue/yellow flagging. Write plot identification numbers and line direction on the ribbon. At each plot, tie yellow flagging above eye level near plot center and another yellow flagging around a sturdy wooden stake marking plot center. On each yellow flagging, write the plot identification number. Between plots, along the cruise line, tie blue flagging at Intervisible points, not to exceed 100' apart. On "measure/grade" plots write the tree number and/or tree diameter on at least the first measured tree (clockwise from the line direction) in yellow paint. All trees on the plot may be marked this way, if the cruiser chooses.

ITS and 100% Cruises: Mark cruise "strips" with various colored flagging (not pink). Mark trees measured and graded with yellow paint.

**9. Cruising Equipment:** Relaskop, Rangefinder, Logger's Tape (with dbh on back), Biltmore Stick, Compass, Cruise Cards in Tatum OR Data Recorder, Cruise Design Cruise Map, Yellow Flagging, Blue Flagging

**10. Attachments:** A. Cruise Map (showing cruise unit boundaries, roads, streams, approx. acres/unit, cruise lines and plot locations, legal description and section lines, BAF or plot size, measure/count plot ratio, north arrow, and scale.

B. Data Recorder Instructions

C. Other

Cruise Design by: Ed Holloran

Approved by: [Signature]

Date: 12/20/16

**CRUISE DESIGN  
ASTORIA DISTRICT**

**Sale Name:** Cougar Looper **Area(s)** 2 B

**Harvest Type:** Modified Clear Cut

**Approx. Cruise Acres:** 12 **Estimated CV%** 80 Net BF **SE% Objective** 9 Net BF

**Planned (Unit) Sale Volume:** 1,457 MBF **Estimated Sale Area Value/Acre:** \$12,400

**A. Cruise Goals:** (a) Grade minimum 100 conifer and 50 hardwood trees:  
(b) Sample 17 cruise plots; (c) Other goals ( Determine "automark" thinning standards;  Determine log grades for sale value;  Determine snag and leave tree species and sizes;  Determine LWD (down wood) cubic feet and decay classes;  Determine "diameter limit" harvest parameters;

**B. Cruise Design:**

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Fixed Plot Size \_\_\_\_\_ Plot Radius \_\_\_\_\_ feet  
Cruise Line Direction(s) 90°/270°  
Cruise Line Spacing 2.5 chains  
Cruise Plot Spacing 3 chains  
Grade/Count Ratio 1:0 (17 measure – 0 count)

If plot falls clearly inside a buffer or No Harvest Area drop the plot. Take plots as marked on map. All Cedar is reserved Timber.

**C. Tree Measurements:**

- 1. Diameter:** Minimum DBH to cruise is 8" for conifers and 8" for hardwoods. Record DBH to nearest ½" for trees < 16", to nearest 1" for trees 16-24", and to nearest 2" for trees > 24". If tree diameters are estimated (only estimate on variable plot cruises), then record to closest estimate.
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**10. Attachments:** A. Cruise Map (showing cruise unit boundaries, roads, streams, approx. acres/unit, cruise lines and plot locations, legal description and section lines, BAF or plot size, measure/count plot ratio, north arrow, and scale.

B. Data Recorder Instructions

C. Other

Cruise Design by: Ed Holloran

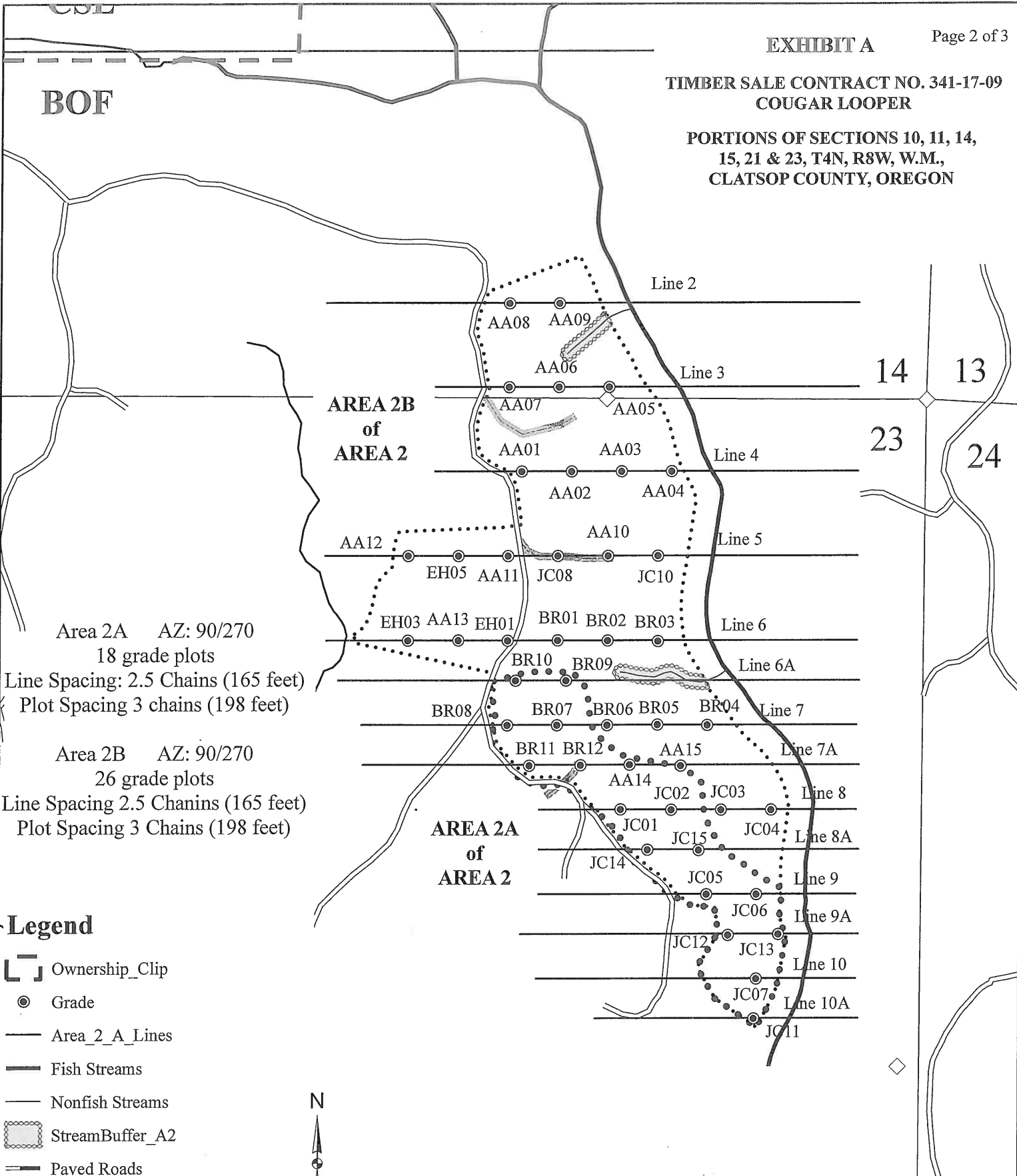
Approved by: [Signature]

Date: 12/20/16

TIMBER SALE CONTRACT NO. 341-17-09  
COUGAR LOOPER

PORTIONS OF SECTIONS 10, 11, 14,  
15, 21 & 23, T4N, R8W, W.M.,  
CLATSOP COUNTY, OREGON

BOF



Area 2A AZ: 90/270

18 grade plots

Line Spacing: 2.5 Chains (165 feet)

Plot Spacing 3 chains (198 feet)

Area 2B AZ: 90/270

26 grade plots

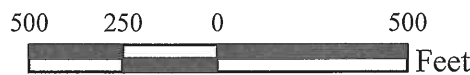
Line Spacing 2.5 Chanins (165 feet)

Plot Spacing 3 Chains (198 feet)

Legend

- Ownership\_Clip
- Grade
- Area\_2\_A\_Lines
- Fish Streams
- Nonfish Streams
- StreamBuffer\_A2
- Paved Roads
- Surfaced Roads
- Timber\_Sale\_Boundary
- Area Boundary
- Survey\_Monument\_Clip
- Section\_Line\_Clip

Approximate Scale: 1 inch = 500 feet



Area 1 (MC) = 54 Acres  
 Area 2 (MC) = 37 Acres  
 Area 2A (MC) = 12 Acres  
 Area 3 (MC) = 87 Acres  
 Area 4 (R/W) = 2 Acres

Total MC Acres = 192



**Species, Sort Grade - Board Foot Volumes (Project)**

T04N R08W S23 TyTAKE 12.00 T04N R08W S23 TyTAKE 34.00	<b>Project: COUGLOOP</b> <b>Acres 46.00</b>	<b>Page 1</b> <b>Date 12/20/2016</b> <b>Time 2:02:40PM</b>
--	--	--

S Spp	So T	Gr rt ad	% Net BdFt	Bd. Ft. per Acre Def% Gross Net			Total Net MBF	Percent of Net Board Foot Volume								Average Log				Logs Per /Acre	
								Log Scale Dia.				Log Length				Ln Ft	Dia In	Bd Ft	CF/ Lf		
								4-5	6-11	12-16	17+	12-20	21-30	31-35	36-99						
D	DOCU		100.0	303													11	22		0.00	1.2
D	DO2S	86	.2	22,066	22,028	1,013		1	24	75	1	1	2	95	39	18	574	3.03		38.4	
D	DO3S	11	.2	2,785	2,779	128		94	6	1	9	4	29	58	34	9	104	0.91		26.8	
D	DO4S	2		376	376	17		97	3		69	25		6	20	7	28	0.48		13.3	
D	DOSM	1		190	190	9				100				100	40	26	1250	5.85		.2	
<b>D</b>	<b>Totals</b>		67	1.3	25,720	25,373	1,167	12	21	66	3	2	5	90	34	13	318	2.04		79.9	
H	DOCU		100.0	32											10	18		0.00		.2	
H	DO2S	65	.7	5,389	5,353	246		9	47	45		1	7	92	39	14	321	2.01		16.7	
H	DO3S	29	.6	2,302	2,289	105		96	1	3	2	5	25	68	36	8	86	0.83		26.5	
H	DO4S	6		484	484	22		100			54	28	18		21	7	31	0.53		15.7	
<b>H</b>	<b>Totals</b>		21	1.0	8,207	8,126	<del>374</del> 373	39	31	30	4	4	12	80	33	9	137	1.17		59.1	
A	DOCU		100.0	192											15	11		0.00		4.8	
A	DO1S	39	.2	1,748	1,744	80			86	14	8	44	6	42	32	13	212	1.75		8.2	
A	DO2S	28		1,219	1,219	56		91	9		13	45		42	31	11	127	1.08		9.6	
A	DO3S	5		251	251	12		100			12	39		49	30	8	70	0.95		3.6	
A	DO4S	28		1,189	1,189	55		100			31	43	3	23	26	6	37	0.58		32.5	
<b>A</b>	<b>Totals</b>		12	4.3	4,599	4,403	203	58	37	5	16	44	3	37	27	8	75	0.87		58.7	
S	DO2S	86		58	58	3				100				100	32	18	430	3.34		.1	
S	DO4S	14		9	9	0		100			100				20	10	70	1.25		.1	
<b>S</b>	<b>Totals</b>		0		68	68	3	14		86	14			86	26	14	250	2.54		.3	
M	DO4S	100	5.3	75	71	3		100					22	78	38	6	54	0.93		1.3	
<b>M</b>	<b>Totals</b>		0	5.3	75	71	3	100					22	78	38	6	54	0.93		1.3	
<b>Totals</b>				1.6	38,669	38,042	<del>1,750</del> 1,749	23	25	51	5	7	7	82	31	11	191	1.47		199.3	

T TSPCSTGR		Species, Sort Grade - Board Foot Volumes (Type)										Page 1									
		Project: COUGLOOP										Date 12/16/2016									
												Time 1:38:48PM									
T04N R08W S23 TTAKE										T04N R08W S23 TTAKE											
Twp	Rge	Sec	Tract	Type	Acres	Plots	Sample Trees	CuFt	BdFt												
04N	08W	23	A2A	TAKE	12.00	18	65	1	W												
Spp	So	Gr	% Net BdFt	Bd. Ft. per Acre			Total Net MBF	Percent Net Board Foot Volume								Average Log		Logs Per /Acre			
				Def%	Gross	Net		Log Scale Dia.				Log Length				Ln	Dia		Bd	CF/ Lf	
D	DO	2S	81	.2	8,446	8,426	101			37	63		0	6	94	39	17	479	2.62	17.6	
D	DO	3S	16	1.2	1,750	1,729	21		100				4	5	36	56	34	9	111	0.92	15.6
D	DO	4S	3		235	235	3		100				19	45	36	27	6	35	0.46	6.7	
<b>D</b>	<b>Totals</b>		49	.4	10,431	10,390	125		19	30	51		1	2	11	86	35	12	260	1.70	39.9
H	DO	2S	75		5,171	5,171	62			57	43		4	16	80	37	16	376	2.32	13.7	
H	DO	3S	20	3.6	1,382	1,331	16		90	10			4	6	7	83	35	9	109	0.95	12.2
H	DO	4S	5		341	341	4		100				53	47		19	7	29	0.61	11.6	
<b>H</b>	<b>Totals</b>		32	.7	6,894	6,844	82		23	45	33		3	6	14	77	31	11	182	1.49	37.6
A	DO	CU														10	14		0.00	1.2	
A	DO	1S	50	.8	1,785	1,771	21			85	15			51	49	34	14	251	1.92	7.1	
A	DO	2S	24		875	875	10		86	14			14	41	46	32	11	137	1.19	6.4	
A	DO	3S	4		141	141	2		100				32	68		24	8	47	0.99	3.0	
A	DO	4S	22		742	742	9		100				27	33	40	27	6	38	0.70	19.6	
<b>A</b>	<b>Totals</b>		17	.4	3,543	3,529	42		46	46	8		10	45	44	28	9	95	1.08	37.2	
S	DO	2S	86		223	223	3			100				100		32	18	430	3.34	.5	
S	DO	4S	14		36	36	0		100				100			20	10	70	1.25	.5	
<b>S</b>	<b>Totals</b>		1		260	260	3		14	86			14	86		26	14	250	2.54	1.0	
M	DO	4S	100	20.0	76	61	1		100					100		32	6	40	0.69	1.5	
<b>M</b>	<b>Totals</b>		0	20.0	76	61	1		100					100		32	6	40	0.69	1.5	
<b>Type Totals</b>				.6	21,203	21,083	253		25	37	38		3	11	11	75	32	11	180	1.45	117.3



TC PSTATS		PROJECT STATISTICS							PAGE	1		
		PROJECT COUGLOOP							DATE	12/16/2016		
TWP	RGE	SC	TRACT	TYPE		ACRES	PLOTS	TREES	CuFt	BdFt		
04N	08	23	A2A	0CC2		46.00	44	264	1	W		
04N	08W	23	A2B	0CC2								
			PLOTS	TREES	TREES PER PLOT	ESTIMATED TOTAL TREES	PERCENT SAMPLE TREES					
TOTAL			44	264	6.0							
CRUISE			43	261	6.1	5,272	5.0					
DBH COUNT												
REFOREST												
COUNT			1	2	2.0							
BLANKS												
100 %												
STAND SUMMARY												
			SAMPLE TREES	TREES /ACRE	AVG DBH	BOLE LEN	REL DEN	BASAL AREA	GROSS BF/AC	NET BF/AC	GROSS CF/AC	NET CF/AC
DOUG FIR			106	29.3	26.0	94	21.2	108.3	25,416	25,373	5,480	5,480
WHEMLOCK			63	36.1	17.6	55	14.6	61.0	8,175	8,126	2,255	2,255
R ALDER			63	37.5	15.6	44	12.6	49.9	4,407	4,403	1,375	1,375
SNAG			23	9.7	19.7	58	4.6	20.6				
BL MAPLE			3	1.3	18.2	39	0.6	2.4	75	71	46	46
S SPRUCE			1	.1	28.0	55	0.1	.6	68	68	18	18
CEDLEAV			1	.3	20.0	63	0.1	.6	19	19	9	9
DOUGLEAV			1	.3	28.0	82	0.2	1.1	109	109	27	27
<b>TOTAL</b>			<i>261</i>	<i>114.6</i>	<i>19.8</i>	<i>62</i>	<i>55.0</i>	<i>244.6</i>	<i>38,269</i>	<i>38,169</i>	<i>9,210</i>	<i>9,210</i>
CONFIDENCE LIMITS OF THE SAMPLE												
68.1 TIMES OUT OF 100 THE VOLUME WILL BE WITHIN THE SAMPLE ERROR												
CL	68.1	COEFF	SAMPLE TREES - BF				# OF TREES REQ.		INF. POP.			
SD:	1.0	VAR.%	S.E.%	LOW	AVG	HIGH	5	10	15			
DOUG FIR		93.0	9.0	1,416	1,557	1,697						
WHEMLOCK		87.9	11.1	374	420	467						
R ALDER		81.3	10.2	147	164	181						
SNAG												
BL MAPLE		21.7	15.0	45	53	61						
S SPRUCE												
CEDLEAV												
DOUGLEAV												
<b>TOTAL</b>		<i>147.5</i>	<i>9.1</i>	<i>707</i>	<i>778</i>	<i>849</i>	<i>869</i>	<i>217</i>	<i>97</i>			
CL	68.1	COEFF	TREES/ACRE				# OF PLOTS REQ.		INF. POP.			
SD:	1.0	VAR.%	S.E.%	LOW	AVG	HIGH	5	10	15			
DOUG FIR		136.8	20.6	23	29	35						
WHEMLOCK		152.9	23.0	28	36	44						
R ALDER		177.0	26.7	27	37	47						
SNAG		230.5	34.7	6	10	13						
BL MAPLE		500.7	75.4	0	1	2						
S SPRUCE		663.3	99.9	0	0	0						
CEDLEAV		663.3	99.9	0	0	1						
DOUGLEAV		663.3	99.9	0	0	1						
<b>TOTAL</b>		<i>91.6</i>	<i>13.8</i>	<i>99</i>	<i>115</i>	<i>130</i>	<i>335</i>	<i>84</i>	<i>37</i>			
CL	68.1	COEFF	BASAL AREA/ACRE				# OF PLOTS REQ.		INF. POP.			
SD:	1.0	VAR.%	S.E.%	LOW	AVG	HIGH	5	10	15			
DOUG FIR		123.1	18.5	88	108	128						
WHEMLOCK		131.0	19.7	49	61	73						
R ALDER		142.3	21.4	39	50	61						
SNAG		199.0	30.0	14	21	27						
BL MAPLE		542.4	81.7	0	2	4						
S SPRUCE		663.3	99.9	0	1	1						
CEDLEAV		663.3	99.9	0	1	1						

**PROJECT STATISTICS**  
**PROJECT COUGLOOP**

TWP	RGE	SC	TRACT	TYPE		ACRES	PLOTS	TREES	CuFt	BdFt
04N	08	23	A2A	0CC2		46.00	44	264	1	W
04N	08W	23	A2B	0CC2						
CL	68.1	COEFF		BASAL AREA/ACRE			# OF PLOTS REQ.		INF. POP.	
SD:	1.00	VAR.	S.E.%	LOW	AVG	HIGH	5	10	15	
DOUGLEAV		663.3	99.9	0	1	2				
<b>TOTAL</b>		73.8	11.1	217	245	272	218	54	24	
CL	68.1	COEFF		NET BF/ACRE			# OF PLOTS REQ.		INF. POP.	
SD:	1.0	VAR.%	S.E.%	LOW	AVG	HIGH	5	10	15	
DOUG FIR		128.6	19.4	20,457	25,373	30,290				
WHEMLOCK		148.7	22.4	6,307	8,126	9,946				
R ALDER		138.7	20.9	3,483	4,403	5,323				
SNAG										
BL MAPLE		533.0	80.3	14	71	128				
S SPRUCE		663.3	99.9	0	68	136				
CEDLEAV		663.3	99.9	0	19	37				
DOUGLEAV		663.3	99.9	0	109	218				
<b>TOTAL</b>		91.9	13.8	32,883	38,169	43,455	338	84	38	

TC TSTATS				STATISTICS				PAGE	1	
				PROJECT COUGLOOP				DATE	12/16/2016	
TWP	RGE	SECT	TRACT	TYPE	ACRES	PLOTS	TREES	CuFt	BdFt	
04N	08W	23	A2A	TAKE	12.00	18	65	1	W	
				TREES	ESTIMATED	PERCENT				
				PER PLOT	TOTAL	SAMPLE				
					TREES	TREES				
TOTAL	18	65	3.6							
CRUISE	17	65	3.8		707		9.2			
DBH COUNT										
REFOREST										
COUNT										
BLANKS	1									
100 %										
STAND SUMMARY										
	SAMPLE	TREES	AVG	BOLE	REL	BASAL	GROSS	NET	GROSS	NET
	TREES	/ACRE	DBH	LEN	DEN	AREA	BF/AC	BF/AC	CF/AC	CF/AC
DOUG FIR	22	15.0	24.5	96	9.9	48.9	10,431	10,390	2,379	2,379
WHEMLOCK	19	19.0	20.2	64	9.4	42.2	6,894	6,844	1,730	1,730
R ALDER	22	23.0	18.1	48	9.7	41.1	3,543	3,529	1,141	1,141
S SPRUCE	1	.5	28.0	55	0.4	2.2	260	260	69	69
BL MAPLE	1	1.5	15.0	33	0.5	1.9	76	61	33	33
<b>TOTAL</b>	<b>65</b>	<b>59.0</b>	<b>20.6</b>	<b>65</b>	<b>30.0</b>	<b>136.3</b>	<b>21,203</b>	<b>21,083</b>	<b>5,353</b>	<b>5,353</b>
CONFIDENCE LIMITS OF THE SAMPLE										
68.1 TIMES OUT OF 100 THE VOLUME WILL BE WITHIN THE SAMPLE ERROR										
CL: 68.1 %	COEFF	SAMPLE TREES - BF					# OF TREES REQ.		INF. POP.	
SD: 1.0	VAR.%	S.E.%	LOW	AVG	HIGH	5	10	15		
DOUG FIR	126.1	27.5	829	1,143	1,458					
WHEMLOCK	64.6	15.2	480	566	652					
R ALDER	91.4	19.9	154	192	230					
S SPRUCE										
BL MAPLE										
<b>TOTAL</b>	<b>151.1</b>	<b>18.7</b>	<b>508</b>	<b>626</b>	<b>743</b>	<b>912</b>	<b>228</b>	<b>101</b>		
CL: 68.1 %	COEFF	TREES/ACRE					# OF PLOTS REQ.		INF. POP.	
SD: 1.0	VAR.%	S.E.%	LOW	AVG	HIGH	5	10	15		
DOUG FIR	117.3	28.4	11	15	19					
WHEMLOCK	201.3	48.8	10	19	28					
R ALDER	123.9	30.0	16	23	30					
S SPRUCE	424.3	102.8		1	1					
BL MAPLE	424.3	102.8		2	3					
<b>TOTAL</b>	<b>85.7</b>	<b>20.8</b>	<b>47</b>	<b>59</b>	<b>71</b>	<b>311</b>	<b>78</b>	<b>35</b>		
CL: 68.1 %	COEFF	BASAL AREA/ACRE					# OF PLOTS REQ.		INF. POP.	
SD: 1.0	VAR.%	S.E.%	LOW	AVG	HIGH	5	10	15		
DOUG FIR	110.7	26.8	36	49	62					
WHEMLOCK	143.4	34.7	28	42	57					
R ALDER	127.2	30.8	28	41	54					
S SPRUCE	424.3	102.8		2	5					
BL MAPLE	424.3	102.8		2	4					
<b>TOTAL</b>	<b>73.1</b>	<b>17.7</b>	<b>112</b>	<b>136</b>	<b>160</b>	<b>226</b>	<b>56</b>	<b>25</b>		
CL: 68.1 %	COEFF	NET BF/ACRE					# OF PLOTS REQ.		INF. POP.	
SD: 1.0	VAR.%	S.E.%	LOW	AVG	HIGH	5	10	15		
DOUG FIR	109.8	26.6	7,625	10,390	13,154					
WHEMLOCK	142.2	34.4	4,486	6,844	9,201					
R ALDER	140.2	34.0	2,330	3,529	4,728					
S SPRUCE	424.3	102.8		260	527					
BL MAPLE	424.3	102.8		61	123					
<b>TOTAL</b>	<b>70.9</b>	<b>17.2</b>	<b>17,461</b>	<b>21,083</b>	<b>24,704</b>	<b>212</b>	<b>53</b>	<b>24</b>		

TC TSTATS				STATISTICS				PAGE	1	
				PROJECT COUGLOOP				DATE	12/16/2016	
TWP	RGE	SECT	TRACT	TYPE	ACRES	PLOTS	TREES	CuFt	BdFt	
04N	08W	23	A2B	TAKE	34.00	26	171	1	W	
				TREES	ESTIMATED	PERCENT				
				PER PLOT	TOTAL	SAMPLE				
					TREES	TREES				
TOTAL	26	171	6.6							
CRUISE	26	171	6.6		4,094		4.2			
DBH COUNT										
REFOREST										
COUNT										
BLANKS										
100 %										
STAND SUMMARY										
	SAMPLE	TREES	AVG	BOLE	REL	BASAL	GROSS	NET	GROSS	NET
	TREES	/ACRE	DBH	LEN	DEN	AREA	BF/AC	BF/AC	CF/AC	CF/AC
DOUG FIR	84	34.4	26.3	94	25.2	129.2	30,706	30,662	6,574	6,574
WHEMLOCK	44	42.2	17.1	54	16.3	67.7	8,627	8,579	2,441	2,441
R ALDER	41	42.6	15.1	44	13.6	53.0	4,712	4,712	1,458	1,458
BL MAPLE	2	1.2	19.5	41	0.6	2.6	75	75	50	50
<b>TOTAL</b>	<i>171</i>	<i>120.4</i>	<i>19.6</i>	<i>62</i>	<i>57.0</i>	<i>252.5</i>	<i>44,119</i>	<i>44,027</i>	<i>10,523</i>	<i>10,523</i>
CONFIDENCE LIMITS OF THE SAMPLE										
68.1 TIMES OUT OF 100 THE VOLUME WILL BE WITHIN THE SAMPLE ERROR										
CL: 68.1 %	COEFF	SAMPLE TREES - BF					# OF TREES REQ.		INF. POP.	
SD: 1.0	VAR.%	S.E.%	LOW	AVG	HIGH	5	10	15		
DOUG FIR	86.4	9.4	1,508	1,665	1,822					
WHEMLOCK	99.8	15.0	304	357	411					
R ALDER	69.7	10.9	133	149	165					
BL MAPLE			60	60	60					
<b>TOTAL</b>	<i>131.7</i>	<i>10.1</i>	<i>851</i>	<i>946</i>	<i>1,041</i>	<i>692</i>	<i>173</i>	<i>77</i>		
CL: 68.1 %	COEFF	TREES/ACRE					# OF PLOTS REQ.		INF. POP.	
SD: 1.0	VAR.%	S.E.%	LOW	AVG	HIGH	5	10	15		
DOUG FIR	109.2	21.8	27	34	42					
WHEMLOCK	121.9	24.4	32	42	52					
R ALDER	153.7	30.7	29	43	56					
BL MAPLE	509.9	102.0		1	3					
<b>TOTAL</b>	<i>75.2</i>	<i>15.0</i>	<i>102</i>	<i>120</i>	<i>139</i>	<i>235</i>	<i>59</i>	<i>26</i>		
CL: 68.1 %	COEFF	BASAL AREA/ACRE					# OF PLOTS REQ.		INF. POP.	
SD: 1.0	VAR.%	S.E.%	LOW	AVG	HIGH	5	10	15		
DOUG FIR	92.8	18.6	105	129	153					
WHEMLOCK	109.3	21.9	53	68	82					
R ALDER	128.3	25.7	39	53	67					
BL MAPLE	509.9	102.0		3	5					
<b>TOTAL</b>	<i>55.1</i>	<i>11.0</i>	<i>225</i>	<i>253</i>	<i>280</i>	<i>126</i>	<i>32</i>	<i>14</i>		
CL: 68.1 %	COEFF	NET BF/ACRE					# OF PLOTS REQ.		INF. POP.	
SD: 1.0	VAR.%	S.E.%	LOW	AVG	HIGH	5	10	15		
DOUG FIR	96.4	19.3	24,749	30,662	36,575					
WHEMLOCK	134.3	26.8	6,276	8,579	10,882					
R ALDER	122.1	24.4	3,561	4,712	5,862					
BL MAPLE	509.9	102.0		75	151					
<b>TOTAL</b>	<i>66.0</i>	<i>13.2</i>	<i>38,220</i>	<i>44,027</i>	<i>49,835</i>	<i>181</i>	<i>45</i>	<i>20</i>		

TC PSTNDSUM		Stand Table Summary										Page	1		
												Date:	12/16/2016		
T04N R08W S23 TyTAKE 12.00		Project COUGLOOP										Time: 9:04:58AM			
T04N R08W S23 TyTAKE 34.00		Acres 46.00										Grown Year:			
S Spc T	Sample DBH	Trees	Tot		Trees/ Acre	BA/ Acre	Logs Acre	Average Log		Tons/ Acre	Net Cu.Ft. Acre	Net Bd.Ft. Acre	Totals		
			FF 16'	Av Ht				Net Cu.Ft.	Net Bd.Ft.				Tons	Cunits	MBF
D	13	2	82	97	2.467	2.27	4.93	16.5	50.0		81	247		37	11
D	15	1	82	77	.927	1.14	1.85	19.0	55.0		35	102		16	5
D	16	4	84	86	2.858	3.99	5.72	24.4	85.8		139	490		64	23
D	17	2	83	115	1.089	1.72	2.18	34.0	118.3		74	258		34	12
D	18	1	89	106	.643	1.14	1.29	37.0	130.0		48	167		22	8
D	19	2	82	106	1.155	2.27	2.31	39.0	125.0		90	289		41	13
D	20	2	87	110	.787	1.72	1.84	40.1	148.6		74	273		34	13
D	21	4	88	124	1.659	3.99	4.51	43.0	174.6		194	787		89	36
D	22	6	88	117	1.529	4.04	4.15	43.9	173.9		182	721		84	33
D	23	7	85	120	2.566	7.40	7.70	44.4	179.0		342	1,378		157	63
D	24	5	85	124	1.632	5.13	4.54	51.8	208.1		235	944		108	43
D	25	2	86	132	.667	2.27	1.67	61.8	246.0		103	410		47	19
D	26	4	84	128	1.082	3.99	2.94	64.5	261.6		189	769		87	35
D	27	6	85	131	1.716	6.82	5.15	64.3	274.4		331	1,413		152	65
D	28	5	84	142	1.199	5.13	3.60	73.8	321.2		265	1,156		122	53
D	29	5	86	142	1.240	5.69	3.72	78.6	374.0		292	1,391		134	64
D	30	2	83	124	.350	1.72	1.05	76.5	323.8		80	340		37	16
D	31	5	85	135	.978	5.13	2.82	91.8	416.7		259	1,177		119	54
D	32	4	86	134	.515	2.88	1.54	94.2	442.4		146	683		67	31
D	34	3	85	149	.364	2.30	1.09	115.0	556.9		126	609		58	28
D	35	2	84	168	.257	1.72	.94	109.5	546.8		103	515		47	24
D	36	3	86	163	.483	3.41	1.77	113.9	600.9		202	1,063		93	49
D	37	2	87	146	.305	2.27	.91	136.5	706.7		125	646		57	30
D	38	3	84	152	.433	3.41	1.59	116.5	590.0		185	937		85	43
D	39	3	86	171	.411	3.41	1.51	139.8	749.1		211	1,129		97	52
D	40	3	85	164	.391	3.41	1.30	153.4	798.0		200	1,040		92	48
D	43	1	86	184	.113	1.14	.45	163.8	925.0		74	417		34	19
D	44	2	84	178	.215	2.27	.86	163.6	895.0		141	771		65	35
D	45	2	81	151	.206	2.27	.62	149.7	786.7		92	486		43	22
D	46	2	85	166	.197	2.27	.79	171.0	936.3		135	738		62	34
D	47	2	84	179	.189	2.27	.66	214.4	1141.4		142	754		65	35
D	48	2	86	176	.181	2.27	.72	194.7	1066.2		141	772		65	36
D	49	2	86	172	.174	2.27	.61	225.7	1224.3		137	744		63	34
D	50	2	86	179	.167	2.27	.67	215.3	1187.5		144	792		66	36
D	52	1	85	169	.077	1.14	.31	222.0	1260.0		68	389		31	18
D	56	1	83	199	.066	1.14	.27	218.0	1380.0		58	367		27	17
D	60	1	83	188	.030	.58	.12	312.8	1780.0		37	210		17	10
D	Totals	106	85	123	29.319	108.27	78.68	69.6	322.5		5,480	25,373		2,521	1,167
H	10	2	82	55	3.148	1.72	3.15	13.0	46.5		41	146		19	7
H	11	2	85	35	3.446	2.27	3.45	11.0	40.0		38	138		17	6
H	12	1	86	32	1.448	1.14	1.45	12.0	30.0		17	43		8	2
H	13	3	82	59	3.802	3.41	3.80	22.3	60.0		85	228		39	10
H	14	3	84	53	2.670	2.85	3.73	18.4	49.9		69	186		32	9
H	15	3	84	68	2.780	3.41	3.71	27.0	80.0		100	297		46	14
H	16	3	85	84	2.443	3.41	4.89	26.0	93.3		127	456		58	21
H	17	4	83	57	2.532	3.99	2.90	34.9	76.4		101	222		47	10
H	18	3	83	71	1.930	3.41	3.22	33.0	98.0		106	315		49	15
H	19	7	85	99	3.476	6.85	8.40	35.1	125.9		295	1,058		136	49
H	20	1	80	78	.521	1.14	1.04	40.0	115.0		42	120		19	6
H	21	6	85	107	1.910	4.59	4.77	44.0	167.1		210	798		97	37
H	22	3	85	117	1.081	2.85	2.81	51.0	200.8		143	565		66	26
H	23	4	84	104	1.383	3.99	3.55	50.2	186.1		179	661		82	30
H	24	2	89	88	.546	1.72	1.09	60.7	236.2		66	258		31	12



TC PSTNDSUM		Stand Table Summary										Page	2		
												Date:	12/16/2016		
T04N R08W S23 TyTAKE 12.00		Project COUGLOOP										Time: 9:04:58AM			
T04N R08W S23 TyTAKE 34.00		Acres 46.00										Grown Year:			
S Spc T	Sample DBH	Trees	Tot		Trees/ Acre	BA/ Acre	Logs Acre	Average Log		Tons/ Acre	Net Cu.Ft. Acre	Net Bd.Ft. Acre	Totals		
			FF 16'	Av Ht				Net Cu.Ft.	Net Bd.Ft.				Tons	Cunits	MBF
H	25	2	89	110	.504	1.72	1.18	69.5	292.7		82	345		38	16
H	26	1	82	107	.308	1.14	.62	81.5	305.0		50	188		23	9
H	27	1	83	99	.286	1.14	.57	85.5	310.0		49	177		22	8
H	29	2	87	98	.496	2.27	.99	94.3	402.5		93	399		43	18
H	30	4	84	107	.586	2.88	1.41	91.6	365.1		129	514		59	24
H	32	2	84	98	.307	1.72	.61	116.1	459.7		71	283		33	13
H	33	2	86	97	.195	1.16	.49	99.2	438.0		48	214		22	10
H	34	1	85	121	.180	1.14	.54	107.3	493.3		58	267		27	12
H	35	1	82	116	.170	1.14	.51	106.7	486.7		54	248		25	11
H	Totals	63	84	72	36.150	61.05	58.89	38.3	138.0		2,255	8,126		1,037	374
A	10	3	86	57	5.255	2.87	5.26	13.0	40.0		68	210		31	10
A	11	2	87	23	2.896	1.91	1.45	10.0	30.0		14	43		7	2
A	12	1	86	45	1.217	.96	1.22	16.0	50.0		19	61		9	3
A	13	1	87	79	1.037	.96	2.07	16.0	50.0		33	104		15	5
A	14	6	86	59	4.925	5.26	5.82	20.9	63.0		122	367		56	17
A	15	9	86	58	6.244	7.66	9.76	19.9	61.2		194	597		89	27
A	16	6	87	63	3.435	4.80	5.49	25.1	77.4		138	425		63	20
A	17	10	87	60	4.279	6.74	7.33	24.7	78.3		181	574		83	26
A	18	4	87	82	2.163	3.82	4.33	33.5	112.5		145	487		67	22
A	19	4	87	70	1.465	2.89	2.93	32.0	106.7		94	313		43	14
A	20	4	87	61	1.322	2.89	1.98	41.1	111.0		81	220		37	10
A	21	5	87	64	1.402	3.37	2.80	36.5	130.9		102	367		47	17
A	22	2	87	56	.369	.97	.55	46.0	123.3		25	68		12	3
A	23	2	86	71	.500	1.44	1.00	49.2	160.0		49	160		23	7
A	24	2	86	65	.608	1.91	1.22	49.8	180.0		61	219		28	10
A	27	1	87	60	.240	.96	.48	57.0	220.0		27	106		13	5
A	30	1	87	89	.099	.49	.20	98.0	415.0		19	82		9	4
A	Totals	63	86	59	37.456	49.89	53.88	25.5	81.7		1,375	4,403		633	203
M	15	1	87	41	.397	.49	.40	22.0	40.0		9	16		4	1
M	19	1	87	48	.485	.96	.49	39.0	60.0		19	29		9	1
M	20	1	87	47	.438	.96	.44	42.0	60.0		18	26		8	1
M	Totals	3	87	46	1.320	2.40	1.32	34.9	54.0		46	71		21	3
S	28	1	83	65	.136	.58	.27	66.0	250.0		18	68		8	3
S	Totals	1	83	65	.136	.58	.27	66.0	250.0		18	68		8	3
Totals		236	85	81	104.380	222.19	193.04	47.5	197.1		9,175	38,042		4,220	1,750



Log Stock Table - MBF

T04N R08W S23 TyTAKE 12.00  
T04N R08W S23 TyTAKE 34.00

Project: COUGLOOP  
Acres 46.00

Spp	S T	So Gr rt de	Log Len	Gross MBF	Def %	Net MBF	% Spc	Net Volume by Scaling Diameter in Inches											
								2-3	4-5	6-7	8-9	10-11	12-13	14-15	16-20	21-25	26-29	30-39	40+
H		DO 3S	32	26		26	6.9			10	3	10		3					
H		DO 3S	36	11		11	2.8			11									
H		DO 3S	38	4		4	1.0			2		2							
H		DO 3S	40	58	1.0	58	15.4			20	5	31		2					
H		DO 4S	14	3		3	.9				3								
H		DO 4S	16	2		2	.7			2	0	0							
H		DO 4S	18	1		1	.1			1									
H		DO 4S	20	6		6	1.5			5	0	1							
H		DO 4S	24	4		4	1.0			4	0								
H		DO 4S	26	1		1	.2			1									
H		DO 4S	30	2		2	.5			2									
H		DO 4S	32	4		4	1.1			4									
H		Totals		376		374	21.4			62	24	59	45	54	91	39			
A		DO 1S	16	6		6	3.0					3		3					
A		DO 1S	30	35		35	17.5					16		10	9				
A		DO 1S	32	5		5	2.3					5							
A		DO 1S	40	34		34	16.7					14		17	3				
A		DO 2S	20	7		7	3.6					3	5						
A		DO 2S	30	25		25	12.5					25							
A		DO 2S	38	4		4	2.1					4							
A		DO 2S	40	19		19	9.5					19							
A		DO 3S	16	0		0	.1				0								
A		DO 3S	18	0		0	.2				0								
A		DO 3S	20	1		1	.4			0	0								
A		DO 3S	30	4		4	2.2				4								
A		DO 3S	40	6		6	2.8				6								
A		DO 4S	16	3		3	1.7			3									
A		DO 4S	18	2		2	1.2			2									
A		DO 4S	20	11		11	5.4			11									
A		DO 4S	24	2		2	.8			2									
A		DO 4S	26	1		1	.4			1									
A		DO 4S	30	21		21	10.5			21									
A		DO 4S	32	2		2	.9			2									
A		DO 4S	38	2		2	.9			2									
A		DO 4S	40	11		11	5.2			11									

Log Stock Table - MBF

T04N R08W S23 TyTAKE	12.00
T04N R08W S23 TyTAKE	34.00

Project: COUGLOOP  
Acres 46.00

S T	So rt	Gr de	Log Len	Gross MBF	Def %	Net MBF	% Spc	Net Volume by Scaling Diameter in Inches											
								2-3	4-5	6-7	8-9	10-11	12-13	14-15	16-20	21-25	26-29	30-39	40+
A	Totals			203		203	11.6			55	11	51	43	27	15				
S	DO	2S	32	3		3	86.0							3					
S	DO	4S	20	0		0	14.0				0								
S	Totals			3		3	.2				0			3					
M	DO	4S	32	1	20.0	1	22.3			1									
M	DO	4S	40	3		3	77.7			3									
M	Totals			3	5.3	3	.2			3									
Total	All Species			1,754		1,750	100.0			151	65	195	149	224	400	232	178	151	5